Effect of dietary linolenic acid (18:3n–3)/linoleic acid (18:2n–6) ratio on growth performance, tissue fatty acid profile and histological alterations in the liver of juvenile Tor tambroides

ABSTRACT

This study was conducted to determine optimal ratios of dietary linolenic acid (18:3n-3, LnA) to linoleic acid (18:2n-6, LA) for Tor tambroides. Juveniles were fed three trial diets with different ratios of LnA/LA (0.0, 0.5 and 1.0) for 10 weeks. Another diet contained 100% palm oil, which was similar tothe diet with 0.0 LnA/LA ratio but different in total amounts of C18polyunsaturated fatty acid, was also used as a control. At the end of the experiment, no significant difference in growth performance was observed among treatments. The overall fatty acid composition in muscle of T. tambroides fed experimental diets was similar in terms of saturated fatty acid and monounsaturated fatty acid. The muscle of fish fed diet with LnA/LA ratio of 0.0 contained significantly lower ($p<.05$) amount of overall n-3 PUFA than those fed the other diets. Intense accumulation of lipid in the liver parenchyma of all fish except for those fed control diet led to severe degeneration of hepatocytes indicating fatty liver. However, most of the hepatocytes of fish fed control diet were also swollen with nuclei migrated. T. tambroides fed diet with LnA/LA ratio of 0.0 showed degenerated enterocytes with an epithelium with disrupted edges. In conclusion, using vegetable oils contained high level of either LA or LnA in T. tambroides diet seemed to have no advantage over using palm oil contained high level of saturated fatty acid.

Keyword: Omega-3; Nutrition; Fatty acid; Malaysian mahseer; Tor tambroides